

**Watertight Door Upgrade Kits (MACHALT 526)**

Description	Part #	NSN
Q.A. – 1 Dog Watertight Door MA 526 Upgrade Kit	96002801	N/A
Q.A. – 3 Dog Watertight Door MA 526 Upgrade Kit	96001604	5342-01-562-1200
Q.A. – 6 Dog Watertight Door MA 526 Upgrade Kit	96001606	5342-01-562-1217
Q.A. – 8 Dog Watertight Door MA 526 Upgrade Kit	96001600	5342-01-562-1189
Q.A. – 10 Dog Watertight Door MA 526 Upgrade Kit	96001601	5342-01-562-1196
I.D. – 1 Dog Watertight Door MA 526 Upgrade Kit	96003001	N/A
I.D. – 3 Dog Watertight Door MA 526 Upgrade Kit	96001605	5342-01-562-1207
I.D. – 6 Dog Watertight Door MA 526 Upgrade Kit	96001607	5342-01-562-1185
I.D. – 8 Dog Watertight Door MA 526 Upgrade Kit	96001602	5342-01-562-1223
I.D. – 10 Dog Watertight Door MA 526 Upgrade Kit	96001603	5342-01-562-1211

**Watertight Dog Door Repair Components (MACHALT 526)**

Component Description	Part #	NSN
Bushing, Straight Q.A	86001200	3120-01-487-6639
Bushing, Straight I. D.	86001900	3120-01-487-6651
Spring, Q.A.	86001400	5360-01-491-6068
Spring, I.D.	86002100	5360-01-491-6071
Paint Shield, Q.A.	86001350	5340-01-514-1903
Paint Shield, I.D.	86002050	5340-01-514-1907
Bushing, Flanged, Q.A.	86002400	3120-01-487-6647
Bushing, Flanged, I.D.	86002450	3120-01-487-6653
Set Screw	86001600	5305-01-487-5106

**DDG-51 Cargo/Forklift Door Dog Repair Components (MACHALT 544)**

Component Description	Part #	NSN
Gore-Tex Seal	06018LP02	5330-01-524-0190
Split Bushing with E-1700	06016LP02	3120-01-524-9250
Bearing Washer, Naval Brass, 1/16" thick	06045LP02	3120-01-524-9469
Bearing Washer, Naval Brass, 1/8" thick	06044LP02	3120-01-524-9469
Machine Screw, Flat Undercut Head	06017LP02	N/A
Socket Set Screw, Cup Point	06021LP02	N/A

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This information is based on our best knowledge, but we cannot guarantee the results to be obtained.

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# WATERTIGHT DOORS U.S. NAVY

**THE SOLUTION FOR NAVY DOOR CORROSION**



**INDIVIDUALLY DOGGED DOOR**



**QUICK-ACTING DOOR**



# WATERTIGHT DOORS U.S. NAVY

## THE SOLUTION FOR NAVY DOOR CORROSION

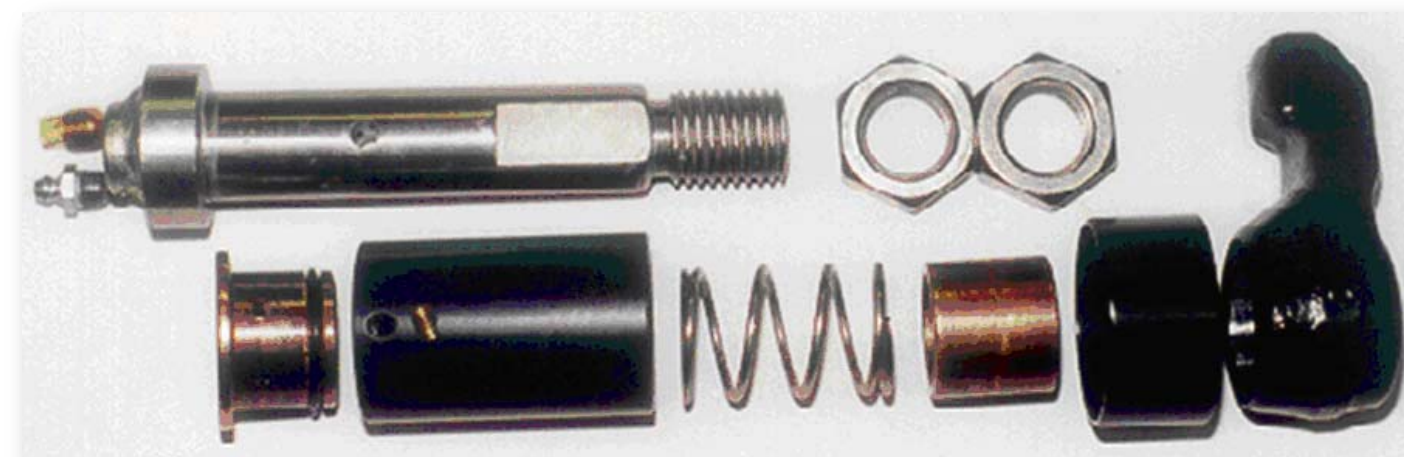
**E-1270EPL** is a non-toxic, patented, environmentally preferred synthetic oil lubricant, which offers outstanding protection for bright wire rope and strand. **E-1270EPL** has excellent lubrication properties; high dropping point, excellent corrosion resistance and outstanding water wash out resistance. **E-1270EPL** has patented mineralization technology inside. The specially compounded ingredients in **E-1270EPL** replace the corrosion process with a mineral formation that forms a mineral barrier approximately 50 angstroms deep onto the surface of the metal. The non-drying, pliable feature of the unique patented formulations repels water and provides healing to any subsequent breach of the mineral barrier. Conforms to Mil-G-18458B for wire rope lubricant.

### PROBLEM

Previous watertight door dog latch designs failed to function properly due to the presence of paint or other debris such as corrosion products on the exposed area of a floating sleeve bushing. The corrosion products formed primarily from corrosion of a carbon steel sleeve, which houses the assembly and is welded to the door. Replacing the string packing and silicone oil in the dog spindle with **E-1270EPL** and the addition of an external shield was evaluated as a solution.

### TESTING

Door dog latch assemblies were subjected to a cyclic corrosion test in which each cycle consisted of immersion in 5 % by weight salt water solution (15 minutes), drying at ambient lab conditions (75 minutes), and exposure to 100% relative humidity per ASTM-D2247 specification, but at a temperature of 120°F (22.5 hours). Periodically the amount of effort required to move the latch was measured and if the latch did not return properly after pushing, it was designated as having failed.



Dogged Watertight Door Latch with MACHALT 526 Components

### DISCUSSION

Exposure of the door dog latch to the cyclic corrosion test exposure resulted in a failed condition by 40 cycles of test exposure. The failed condition occurred because the floating bushing became stuck within the carbon steel sleeve and did not return properly, due to the presence of corrosion products in the interface area between the bronze floating bushing and the carbon steel sleeve. Replacement of the string packing and/or silicone oil with **E-1270EPL** in the dog spindle doubled the number of successful test cycles achieved (80 cycles). Further enhancement was achieved by using a stronger spring and by adding an external shield to entrap **E-1270EPL** around the exterior surface of the floating bushing. These additions extended the performance to a minimum of 110 test cycles.

### CONCLUSION

In 1999, the Navy issued MACHALT (Machinery Alteration) 526, which changed the design of the internals of weatherdeck watertight and airtight door dogging mechanisms to a new design. The basis of that design is the use of **E-1270EPL** inside the spindle sleeve in the doorframe to stop the corrosion that had been the cause of dogging mechanism failure. The **E-1270EPL** combined with noted design changes dramatically improved the cyclic corrosion performance of the watertight door dog latch. The watertight door dogging mechanism corrosion problem was one of the top maintenance issues for the fleet. In May 2002 a second MACHALT, 544, was approved to apply the same technology to ballistic type dogs in three watertight doors in DDG-51 Class ships. The solution represented a significant cost savings for the fleet.